

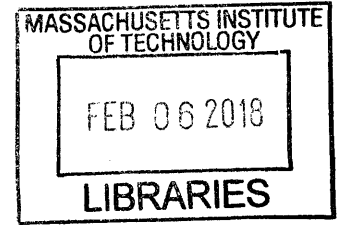
The Theater of Innovation: Developing Skills to Perform Hybridity

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SUBMITTED TO THE SLOAN SCHOOL OF MANAGEMENT IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN MANAGEMENT RESEARCH

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

FEBRUARY 2018

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Submitted to the Department of Management on December 4, 2017 in partial fulfillment of the requirements for the Degree of Master of Science in Management Research

Abstract

Multivocal identities have often been thought to provide social actors with more resources and opportunities over time than other “limited,” singular identities. However, less is known about how organizations actually accomplish embodying multiple identities. By looking inside a hybrid organization, this paper uses ethnographic data to document how an organization successfully sustains its hybridity despite challenges associated with making multiple identity claims. The paper analyzes how the organization socializes individuals to perform its particular hybrid organizational identity. A common practice known as demonstrations served as an integrative practice-based mechanism enabling actors confronted by distinct social worlds, and norms, to enact otherwise competing roles and framings of their work so that their performances did not convey incompetence or betrayal of alternative normative expectations. The findings show that to successfully perform the organization’s hybrid identity, the actors developed a transferable skill set, which enabled them to credibly deliver on their manifold roles as academic researchers, social hacktivists, and commercial product designers.

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The notion of embodying “hybridity” as an organizational form (Albert and Whetton, 1985; Pratt and Foreman, 2000; Golden-Biddle and Rao, 1997; Foreman and Whetton, 2002; Haveman and Rao, 2006; Battilana and Dorado, 2010; Pache and Santos, 2013; Besharov and Smith, 2014), by combining elements of distinct, often contradictory, organizing principles, structures, or goals, (Kraatz and Block, 2008) can be understood as an organization’s attempt to take what has been described for individuals as “robust action.” Robust action, interchangeably referred to as “multi-vocality,” names “the fact that single actions can be interpreted coherently from multiple perspectives simultaneously” (Padgett and Ansell 1993, p. 1263). Hybrid organizations attempt to take robust action, or enact multi-vocality, by seeking positive evaluations from several different audiences that may have competing interests and conflicting norms for what constitutes a successful role performance, in order to obtain legitimacy and secure material resources from each simultaneously. By offering multiple, sometimes competing, framings of “what they do,” and thus, “who they are,” to their audiences these organizations distinguish themselves from organizations that conform (Albert and Whetton, 1985; Pratt and Foreman, 2000; Whetton, 2006), if only ceremoniously (Meyer and Rowan, 1977), to the distinct categories that the hybrid is attempting to combine. Essentially, these types of organizations explicitly exhibit what should be understood as a “multivocal identity.”

Assuming, or being assigned, a multivocal identity has often been thought to provide social actors with more resources and opportunities than other “limited,” singular identities (Abbott 1988; Padgett and Ansell, 1993; Hsu and Hannan, 2005). Singular identities initially signal commitment and capabilities to audiences facilitating the actor’s social valuation (Zuckerman, forthcoming, 2017). That organizations make multiple identity claims with the expectation that this will be more beneficial rather than simply pursuing a singular identity is puzzling. Yet, these organizations continue to emerge and manage to persist in many fields, ranging from the non-profit sector (Golden-Biddle and Rao 1997), healthcare industry (Pratt and Rafaeli, 1997), cultural institutions (Glynn, 2000), micro-finance (Battilana and Dorado, 2010), and other social enterprises (Pache and Santos, 2013; Ashforth and Reingen, 2014). Presumably, organizations that have established themselves with singular identities potentially risk becoming rigid and inert over time, and thus less able to respond to changing environments. Actors may attempt to assume a multivocal identity to maintain flexibility and discretion over potential lines of action in order to take advantage of unforeseen opportunities that might emerge in their environments while staving off the strategic constraints of being committed to singular identities (Leifer, 1988; Padgett and Ansell, 1993; Zuckerman et al. 2003).

But while we might presume that multivocal identities are valuable, we know less about how organizations actually take robust action, or enact multi-vocality. The structural conditions that enabled Cosimo D’Medici (Padgett and Ansell 1993), the celebrated case of an enterprise embodied in a single individual, does not fully account for how a modern, complex organization composed of various individuals credibly enacts multi-vocality, and comes to successfully embody a hybrid organizational form. Embodying a multivocal identity may seem advantageous, but “doing” (West and Zimmerman, 1987) the actual identity-work (Gieryn, 1983; Van Maanen, 2010) involved in delivering a credible role performance as a hybrid organization is a contingent accomplishment.

The socialization of individual employees within hybrid organizations, whereby they are enlisted to perform practices that instantiate the organization's hybridity, is a particular contingency to accomplishing a multivocal identity. Socialization is a challenge in organizations that bring together individuals with different histories and from different professions to work toward a common organizational goal because of the potential for conflicts among employees (March and Simon, 1958; Cyert and March, 1963). Professional identities can be a potential source of conflict because employees may view themselves in opposition to one another, as members of groups with differing interests and goals, or even in opposition to the organization itself if they believe the common goal undermines deeply-held commitments to their individual professional identities or larger occupational communities (Van Maanen and Barley, 1984; Turco, 2012). That professional identities of individuals can actually end up in conflict is particularly challenging for hybrid organizations (Kraatz and Block, 2008; Battilana and Dorado, 2010).

A study focusing on individuals working in micro-finance institutions (Battilana and Dorado, 2010), suggests hybridity can be managed by hiring employees with no prior professional identifications and training them to orient their commitments to the organization's overarching goals. However, most employees do not enter organizations "tabula rasa" (Battilana and Dorado, 2010), with absolutely no prior educational background and previous work experience. In general, newly hired employees arrive with pre-existing occupational orientations and aspirational goals with which they engage their new organizational roles. Socializing organizational members with varied orientations and pre-existing commitments to enact multi-vocality on the organization's behalf is not necessarily a straightforward process. A central question for the current study is how the organization enlists its employees to enact multi-vocality. This paper shows how an organization accomplishes its hybridity despite the challenges associated with making multiple identity claims, such as the potential for identity conflicts among personnel. The argument here is that an organization's integrative practices may help socialize employees to enacting multi-vocality, while granting individuals the opportunity to develop a transferable skill set, and that this is a sufficient condition that successfully sustains a hybrid organizational identity.

This paper explores an empirical setting, the "Medici Lab" (or Lab), exhibiting a hybrid organizational form: situated in the erstwhile sacred space of academia the Lab directly secures resources from private companies. As a hybrid organization, the Lab engages audiences across both academic and commercial worlds being at once an academic program and an innovation incubator partnered with corporate sponsors. Contrary to what might be expected (Golden-Biddle & Rao, 1997; Pratt & Rafaeli, 1997; Glynn, 2000; Pache and Santos, 2013; Battilana and Dorado, 2010; Ashforth and Reingen, 2014; Besharov and Smith, 2014), the Lab did not succumb to endemic conflict often found within organizations that make claims to multiple identities. Moreover, the Lab is now in its thirtieth year and continues to attract high-caliber faculty and graduate students while receiving ample funding from commercial partners. The Lab continues to offer an ongoing performance of its own hybridity to its audiences, which, in this context, was empirically observed during a central and common practice known as demonstrations ("demos"). The Lab's "culture of demos" gave actors an opportunity to develop a transferable skill set that enables them to enact multi-vocality and sustain the organization's

hybridity while developing capacities for occupational success in either academia or business. In what follows, I provide empirical support for these observations by analyzing the common practice of performing demonstrations within the hybrid organization.

The paper provides a description of the research setting followed by the methodology and analytic approach. I describe the actual practice of performing demonstrations and how actors learned to deliver successful role performances on behalf of the organization. I analyze how this practice came to be viewed by actors as an opportunity to develop human capital that would enable them to credibly play manifold roles, while not erasing entirely their deeper commitments to their respective occupational communities. Because success depended on successful role performances, I employ dramaturgical concepts to identify the specific transferable skills that actors acquired in the process of their socialization. Through participation in demonstrations, employees learned how to design and make props, develop scripts and tell stories, read cues from their audiences, improvise based on these cues, and refine their dramatic delivery to support their performances. I conclude by explaining how one hybrid organization socialized its employees into enacting multi-vocality and successfully sustained its own hybridity while suggesting the import of an integrative practice, performing demonstrations, in other settings such as venture capital and other forms of cultural production.

RESEARCH SETTING & METHODS

This article draws on a 14-month ethnographic study of the “Medici Lab.” The organization was founded in 1985, its academic status anchored by its affiliation (and physical location) with an established research university. The faculty it hired early on were in the emerging fields of computer science and artificial intelligence. In a report to the president of the parent institution, the founding director claimed, “They were the misfits who didn’t fit into the academic categories.”¹ The Lab publicly promoted its academic program as an alternative to traditional departments in the fields of science, engineering, and design that would intentionally “blur the lines between academia and the real world.” The Lab still actively promotes itself to the public as an “anti-disciplinary” academic program that “continues to check traditional disciplines at the door.”

The Lab is organized as a consortium composed of 25 semi-autonomous research groups. At the time of this study, there were 27 faculty members serving as principal investigators (PIs) for their research groups and a dozen postdoctoral, visiting research fellows. The faculty advised a total of 157 graduate students (87 master’s and 70 doctoral students). The students worked on a portfolio of almost 350 ongoing research projects across the groups. Similar to other academic programs, the Lab’s graduate students attended a sequence of requisite courses before producing original research for a Master’s Thesis or Doctoral Dissertation required for graduation. The Lab grants advanced degrees (MAS and PhD) based on the successful completion of these requirements.

The Lab is funded primarily through sponsorship from over 80 “member” companies that pay a fee of \$250,000 for a three year membership, which grants them access to visit the Lab and

¹ Reports to the President (1985 - 2012). Communications Office. Archive online.

non-exclusive licensing rights for patents based on research being conducted at the Lab. Resources from corporate sponsors are pooled and shared across the organization to fund the independent agendas of each research group. This financial support currently amounts to an annual operating budget of over \$40 million. The faculty and student body are supported by an in-house administrative staff in finance, contracts, communications, and program coordination. A public relations team maintains relationships with the business and technology press (offering daily tours for journalists) to promote and manage its image to wider, tech-savvy audiences.

The study's methodology – a grounded theory analytical approach (Glaser & Strauss, 1967; Charmaz, 2014) – is based on fieldwork that included attending research group meetings and weekly administrative meetings, shadowing administrative staff, attending regular speaking events hosted by the director, and special student-led events and social gatherings. I audited a one-semester graduate course taught by members of the Lab's faculty and sat in on sessions of PhD student-led seminars, observed in-house presentations during "Crit-Day" (an internal lab-wide event held to share and refine students' thesis proposals), and attended the two bi-annual, lab-wide events known as "Member's Week" (a special event hosted at the Lab over the course of three days for sponsors). During Member's Week, sponsors, and potential sponsors, attend keynote addresses by faculty and a lab-wide showcase of demonstrations performed by students throughout the building.

Fieldwork included observation of over 100 live demonstrations, dozens of which were performed during scheduled day-long tours by visiting groups of corporate sponsors that I shadowed, and the remainder during a series of internal events and the two bi-annual, lab-wide events. This allowed me to observe students, staff, and faculty, as well as members of the media and corporate sponsors interacting together at one time or another over the course of a year.

I supplemented my observations with hour-long formal interviews, which included a total of 44 interviews with students and staff (evenly split between both groups). After observing demonstrations of their projects, I would approach students and ask to schedule a one-on-one interview, and then follow up with emails to confirm. Similarly, after administrative meetings, I would approach staff members to schedule interviews. I stopped requesting formal, scheduled interviews once I had achieved saturation from informants. I also pursued informal conversations with students and staff inside and outside of the Lab's setting. I had hundreds of these informal, perhaps 5 to 20 minute conversations, over the course of my fieldwork. I also used the informal conversations to supplement my observational data.

I was subscribed to the internal email distribution list for the Lab, and thus received thousands of e-mail communications that were directed to the Lab's members at large. I collected hundreds of internal documents shared at meetings, in emails, and online. Finally, since the Lab had been the subject of prior studies and popular press coverage I collected and reviewed these sources as well.

Thus, the primary data analyzed for this paper include more than 1,300 pages of field notes and interview transcripts, as well as the internal documents and e-mails. I analyzed the data by coding for patterned themes that emerged from the data (Glaser and Straus, 1967; Charmaz, 2006), going back and forth iteratively between the data, memo writing, and literature reviews.

For this paper, I focused on the organization's central practice of performing demonstrations of applied technological innovations based on academic research projects by graduate students, and how these were conducted and interpreted by my informants.

DEMONSTRATIONS of a HYBRID ORGANIZATIONAL IDENTITY

The Practice of Staging and Selling Innovation

According to internal documents, the founding director of the Lab “reimagined the academic phrase ‘publish or perish’ as ‘demo or die,’” premised on a strongly-voiced antipathy toward traditional academic scholarship. That this could be made explicit within the context of an academic institution that the Lab is situated in is perhaps ironic. According to local accounts, the original faculty did not fit into any disciplinary category, and so a “proof of concept” became necessary for colleagues to evaluate each other's work. In fact, since many traditional academic journals in the sciences and engineering were reluctant to publish what seemed “futuristic” research at the time, it was also difficult for faculty at the Lab to reference their work and meet the criteria in grant applications for governmental sources of funding. Furthermore, the Lab's innovations, being so “futuristic” and “radical,” would not be understood by wider audiences without physically showing their work. More important, the Lab needed a way to secure resources from audiences in order to support their fringe projects in the emerging fields of computer science and artificial intelligence or risk going unfunded.

The solution was to institute a practice of tangibly demonstrating the functionality of prototypes to show how research was leading to technological innovations, and possibly, how these prototypes could be developed further into products that private companies might be interested in marketing. The practice of demonstrating the commercial viability of research projects became the lynchpin to securing resources from corporate sponsors. The consortium of research groups pool their resources by successfully “inspiring” private companies to join as “members.” In exchange for funding, members are granted physical access to the Lab during hosted tours. Corporate sponsors are also granted non-exclusive licensing rights to intellectual property filed during their tenure as members. By inviting sponsors into this academic setting, demonstrations became a way to share the Lab's research projects' along with their potential for commercialization. Thus, “demo or die” was locally legitimated by a simple narrative: some innovations must be experienced firsthand to elicit positive evaluations by interested audiences to support ongoing research.

As full-time research assistants, and unlike other programs on campus, students were required to regularly pitch (several times a month) their technological innovations to private companies that had either been invited to attend or requested a tour of the Lab. The rotation and rhythm of scheduled tours by sponsors, and the everyday delivery of these performances, punctuated daily life at the Lab. All of the students were required to demonstrate their projects in front of private-sector audiences. In essence, the Lab “hired” graduate students to perform demonstrations of their technology to private-sector audiences for the purposes of financing its consortium of research groups. One senior PhD student told me that the Lab is not constantly innovating, but is always “selling innovation.” In this student's experience, “A lot of it was refining the pitch of the project more than like the substance or the engineering.” Of course,

demonstrations are also viewed as valid knowledge claims in certain fields, possibly leading to academic publications, but these demonstrations are also viewed as substitutions for “pure” academic research. While faculty and students might eventually publish or patent their research, they might also develop marketable products. Again, unlike other academic programs in basic sciences, the Lab made their “anti-disciplinary” position against traditional normal science standards explicit. However any particular project might develop in the future –as a contribution to basic science or as a marketable product– and whatever their previously-held occupational orientation or anticipated career ambitions, each of the students were expected to sufficiently master the art of performing demonstrations. Thus, on a regular basis, students could be observed performing demonstrations in front of visiting groups of corporate sponsors that toured the Lab.

From its inception, however, the Lab framed its overarching goals in nonmarket terms, as an academic program granting graduate degrees from an elite science and engineering institution. Yet, it also continuously required its student-employees to demonstrate for private companies the commercial viability of their research projects. The students would describe their projects as ‘radical innovations based on bleeding-edge academic research,’ ‘breakthrough technologies beyond the frontiers of our knowledge base that can serve as solutions to societal problems,’ or as ‘futuristic devices that could be developed into products with commercial viability.’ In effect, however, the demonstrations for corporate clients challenged commitments to disinterested knowledge production, a fundamental norm in scientific disciplines (Owen-Smith, 2001; Stern, 2004; Murray, 2010), while simultaneously successfully raising the funds to support basic research alongside applied product development. Thus, the practice of performing demonstrations of technological innovations based on graduate students’ research projects performed the Lab’s multi-vocal identity, in effect providing a demonstration of the Lab’s own organizational hybridity. The Lab is both an academic teaching and research organization as well as an innovation incubator and “maker space.” As performances of the organization’s hybridity, the common practice of demonstrations provides an empirically rich site to observe the lived-experience of enacting multi-vocality on a day-to-day basis within an organization with a robust identity.

The Theater of Innovation

The staging areas for demonstrations

“[Sponsors] are continuously touring through the [Lab]... so while at the same time there’s innovation going on, there is also what I call the ‘theater of innovation’ going on... because it’s like people are always parading groups through here to show them the work and stop and have these demos done by students.” (MAS Student)

“You’re basically putting together a theatrical production here, with the demos.” (Admin)

The “new building” resembled a massive contemporary art gallery with the effect of accentuating the physical objects on display as well as the Lab’s ongoing activities. The immediate impression upon entering the building is that everything (and everyone) seemed to be on exhibit. The main entry opens into a lobby with a central atrium where you might encounter an installation of a suspended dome made from silk worms, or a 3D-printed skeletal structure

made from organic materials, or exquisite glass vases made from a robotic arm and designed with the assistance of artificial intelligence. From the lobby you can look up and see a row of mannequins modeling mechanical prosthetics. As you ascend from the lobby's "space for exhibitions," you are invited to observe people standing at drafting tables behind large glass walls that enclose large, shared lab spaces. According to the organization's website, "High levels of transparency throughout the interior... make the ongoing work of the various laboratories visible... and facilitates sponsor tours and demonstrations that are so vital to the [Lab]." It becomes apparent in the architecture that every detail has been carefully designed to allow for a voyeuristic foray into the organization's inner workings, or so it would seem. In many ways, this pan-optical anterior leading into the Lab can be overwhelming, and, in the flood of visual stimuli, the transparent walls can become wholly opaque to the uninitiated spectator. The shared lab spaces' massive glass panes are imposing, as their size and sheer limpidity is enough to make one self-conscious of staring. Yet, from any vantage point, visitors are privy to inspect prototypes, and the students, at different phases of the product-development process.

In every lab space, there are designated areas for staging demonstrations, which is where students physically guide audience members through their research group's portfolio of projects. The staging areas were overwhelmingly dotted with prototypes. There were shelves filled with miscellaneous materials – usually books, electronic components, or plastic drawers filled with cables, wires, and sensors, or other tools of trade like you would see in a hardware store. Or in another lab space, the shelves were filled with prosthetic ankles and knee joints and the arms and feet of mannequins. However, the shelving is not merely used for storage, but served as walls for sectioning off the demonstration's staging area from behind-the-scenes workshop areas. The workshop areas are where students work on building prototypes or writing programming code, but also where research groups hold their regular meetings when the faculty and students share project updates with one another. The workshop benches were usually messy and cluttered with table lamps, soldering guns, drills, wire cutters, clamps, tape, and spray adhesives, or an occasional ukulele. The research groups used black fabric as curtains draped from their shelving to mask unwanted views from visitors, which further defined the staging areas' back and front regions. These staging areas were so prominent that the backstage workshop area only made up half of the shared lab space.

The architectural design and physical layout of lab spaces primed the perceptions of audiences of the "futuristic," "open," and "radical" innovation being conducted at the Lab. A staff member enthusiastically shared this interpretation, "You're seeing it happening right in front of you... I think the environment that's created is part of what makes the story compelling as well." Yet, all the spatial configurations and masking devices that physically defined the staging areas were placed in a way that was not meant to be immediately obvious to visitors, but in a way that gave off an impression of technological innovations "in the making" and "unveiled." Many students expressed a certain degree of ambivalence over what they viewed as an overemphasis on this aspect, as one commented, "The environment of the lab is interesting because a lot of people will come to the Lab... we demo for them, and we show them our projects and everything, and then they get like really excited about what the Lab looks like, and the environment... I feel like the Lab, the way that it's designed, is very conducive for visitors. It's almost like a museum, you know." Nonetheless, the staging areas for demonstrations were

where students acted out what it looked and sounded like to be a competent member of their research groups, which in many respects meant producing “demo-able” projects that would assist in securing resources from the Lab’s audiences. The distinctions maintained between the staging areas and the workshops produced liminal regions throughout the building — simultaneously an academic setting for conducting research that doubled as an exhibition space for technological innovations with commercial viability to private-sector audiences.

The format for performing demonstrations

Demonstrations are given standing in a semi-circle at the center of the designated staging areas or seated around a large conference table or on leather sofas around a small coffee table in front of a massive flat-screen monitor. Some involved presenting audiences with physical prototypes and interactive digital interfaces, whereas others involved presenting text and image-based slides, but most were a combination of these. Demonstrations were mainly performed live, but were also video-recorded to be shared online through social media, or looped and re-played on flat-screen monitors placed throughout lab spaces to further augment the ongoing live performances. Just before a demonstration, students stood in the wings and waited, or kept busy working on their computers or at a workbench, giving the visiting group a few moments to gather into a semi-circle or take their seats. The students would then step forward, briefly introduce themselves, and dive into explaining the functioning of a prototype, or narrate a video of a software simulation.

Typically, demonstrations were composed of a combination of physical prototypes – small products like wristwatches and VR goggles to sizable mechanical objects like robots and shape-shifting table-top models – and PowerPoint presentations (PPT) of images and looped videos of software designs for interactive interfaces or other projects that were more conceptual. Many students used the same format for their PPTs, which was meant to lend stylistic consistency in presentations’ layouts across research groups. The PPT slides mainly showed high-quality photos or illustrated diagrams, schematic sketches, and CAD renderings, which made for an overwhelmingly image-based presentation.

Across groups, student’s research projects’ topics ranged widely from developing network algorithms for predicting mental health risks, designing wearable sensors and interfaces that would detect affective states, inventing holographic displays and video gaming visors, enhancing 3D printing of organic materials, developing mobile phone applications that could be used to conduct eye and dental exams, as well as projects in artificial intelligence, robotics, synthetic biology, and mechanical prostheses. These prototypes, physical or conceptual, would be shared with live audiences during demonstrations in the formats described above.

At the close of a demonstrations, approximately 30 minutes after it started, program managers responsible for organizing the tours would enter the lab space and stand at the rear of the designated demonstration area just behind the audience. The punctuality of program managers allowed students to depend on their appearance as a cue to close their demonstrations. Upon concluding their demonstrations, students almost invariably walked over to their desks, which were clearly visible to the visiting group, and would begin working at their keyboards, leaning in and looking closely at their computer monitors, as if picking up where they left off,

totally engrossed with their “real” work. The program manager would promptly usher the visiting group out and into the next lab space to watch the next demonstration.

Table 1. The Practice of Performing Demonstrations - Variations in Presentation Styles*

Types of Demonstrations	Data
Slide Presentations (with embedded videos)	<ul style="list-style-type: none"> ▪ "We'll create visual materials, images, video, illustrations that help tell the story of the work... so we create sort of a whole package that the researchers can bring to their conversations... that really helps tell their story very well." ▪ "We need, you know, something that describes how the work is innovative, how it's relevant, how it can be applied... We need some visual materials, and each project will lend itself to different kinds of visual material, whether it's, you know, a picture of the actual device, or whether it's a screen shot of what it does, or whether it's a process that's happening... it depends on the project, on the work."
Physical Prototypes	<ul style="list-style-type: none"> ▪ "I would say, like there's an overarching philosophy of storytelling and communication through the physical objects in our world." ▪ "The process of your research is more [pause] set up to produce artifacts, these short little artifacts you may hack together over a weekend, and present, and that are very demo-able..." ▪ "It's not enough to have sketches. You need to have something... A thing that works, like, that you can show people."
Combination of Slides and Prototypes	<ul style="list-style-type: none"> ▪ "People in the group have really different styles, like, some people will stick to the slide deck and kind of go through it basically the same no matter what they do, and some people don't like the deck and just show videos and just talk. I kind of try to do a combination of both." ▪ "A lot of the work that we do takes the form of physical or virtual projects.... Whether it's on a computer screen or whether it's a physical piece, they are basically all made to be able to demo an idea, or show what the results of your research are in a very tangible way..."

*Quotes taken from formal interviews with Master's and PhD students and administrative staff (N=44)

The professional identities of the actors

Students admitted to the Lab's academic programs enter with varying educational backgrounds, previous work experiences, and preconceptions of themselves as well as their anticipated role as graduate students. A senior staff member explained, "So we have a lot of students that come to us, and they've already been in industry for a while, and they've worked for corporations... Other people come here, you know, not thinking about that or wanting to think about anything like that, and others come here with a more kind of idealistic view..." Staff and students alike regularly pointed out the diversity of disciplines across research groups:

"We have a composer, we have a designer, we have a person who's an expert in sensing, we have somebody who's an expert in how kids learn. I mean, it's incredible, we have twenty-something different groups, each one of which has a very different research focus, but there are points where they come together, and they're points where they diverge, but that friction is part of the intellectual rigor." (Senior Admin)

“We’re all very different, I think our backgrounds are very, very different, or our expertise, or whatever you wanna call it... we’ve got an architect, we have filmmakers and artists, designers, computer scientists. Yeah.” (MAS Student)

In one instance, during a visit by a sponsor, an audience member asked a student “what is your background, what were you trained in?” The student, interested in going into industry, quickly listed her educational pedigree in mathematics, where she had previously worked, and then said, “now I am doing something at the [Lab] that’s between computer science and design.”

Students I interviewed placed themselves along “three tracks,” which were referred to as the “academic route”, “working in industry”, or “doing a startup.” Each of these tracks were viewed as legitimate options and promising career paths. Students that planned to go into academia emphasized the importance of publishing and downplayed “selling” innovation. One student made their identification very clear, “For me, fundamentally, I want to publish academic papers and anything that takes me away from spending more time working on a research project is a negative thing in my mind.” This student explained the challenge of “being an academic,” but being at the Lab and directly engaging private-sector audiences on a regular basis, saying, “I think I fall more in the camp that wants to do academic research that’s far-out there, and I think that this is in some ways orthogonal to the sponsors who want to find something they can put into products in the next one or two years, but the stuff that I want to do is even further out.”

Alternatively, students that had come from working in the private sector might consider going directly back into industry. As one Master’s student exclaimed, “No. Not academics. No, never academics.” One senior PhD candidate, for example, had the expressed intent to conduct research with its commercial viability in mind, stating, “All my research is actually consulting work that I make look like research because I want to make actual applications that impact an organization, which is opposite of most of the people in the [Lab].” For many graduate students with an engineering background, an advanced graduate degree is just a stop along the way to a more financially secure career in industry.

A third group of students talked about “doing a startup” and becoming entrepreneurs. One student explained, “So I don’t want to be an academic. I thought about it before in the past, but I don’t necessarily want to be an academic. I would like to do a start-up.” Another senior PhD candidate claimed, “I think that there’s this third area where people want to start up their own company based on their research, which is what a lot of people want to do.” Many students were interested in “releasing products” or “putting stuff out into the real world” because they did not see themselves as academics, but did not want to be constrained by the demands of a job in industry. Students that wanted to be entrepreneurs often claimed that they were really “hackers,” but viewed commercialization as a means to independently continue their research agendas.

Table 2. Variation in Occupational Orientations by Student Types*

Occupational Orientations	Data
Academic-oriented	<ul style="list-style-type: none"> “I think I fall more in the camp that wants to do academic research that's far-out there, and I think that this is in some ways orthogonal to the sponsors who want to find something they can put into products in the next one or two years, but the stuff that I want to do is even further out.” “I want to get into academia, that’s why I think publications are important. If I was going into industry, obviously publications would be much less important.” “I am an academic, I'm totally obsessed with the research, and not what’s success or failure, or what are you gonna do after this, I’m like, 'I don’t care,' I just wanna [laughs] learn, I want to become the expert at what I’m doing, I want to follow this vision that I have, figuring out things.” “I want to go into academia... I’ve been told many, many times, countless times, both by sponsors and other people that, 'Oh, you should definitely do a startup,' so I’m very aware of possibilities, but that’s just not who I am, I can’t... I know it probably goes against the grain at the [Lab].”
Industry-oriented	<ul style="list-style-type: none"> “I just want to make an impact and I was originally going to go down an academic route, but I just realized I can make more of an impact in the commercial world.” “All my research is actually consulting work that I make look like research because I want to make actual applications that impact an organization, which is opposite of most of the people in the [Lab].” “So I don’t want to be an academic. I thought about it before in the past, but I don't necessarily want to be an academic. I would like to go into industry, or do a start-up.”
Entrepreneur-oriented	<ul style="list-style-type: none"> “I think that there's this third area where people want to start up their own company based on their research, which is what a lot of people want to do.” “I believe there’s been kind of a shift towards more startup-culture thinking.” “I would say the ideal, really the ideal outcome for me would be that I find a balance between academic work, academic research, and have a business on the side that comes out of my research.” “I have interest in releasing products...starting my own company... I definitely get a lot of pleasure out of putting stuff out into the world, so being in a research lab in [a university or private company] and not having stuff see the light of day would not be the end goal.”

*Quotes taken from formal interviews with Master’s and PhD students (N=22)

The next section documents the Lab’s socialization process for student-employees, describing how students learn first-hand what it looks and sounds like to deliver a successful role performance. By participating in the practice of performing demonstrations themselves the students come to know the art of performing manifold roles that might otherwise be seen as contradictory.

Performing Hybridity

Learning to deliver a successful role performance

“I would say that at the beginning, when I first came to the lab, I sort of was just kind of thrown into it, and then I was just doing it as a part of, kinda, my role here as a student.”
(MAS Student)

Students learned to perform demonstrations within the first few weeks or months of beginning their program by observing the principal investigator (PI), a faculty member who serves as the research group's director and students' advisor, and their senior colleagues perform demonstrations. One student shared their experience, "So within my first year, I guess the process of learning how to do a demo is usually you will sit down and observe a few of the senior graduate students do demos during the first semester to get a sense of how they talk about things." Another student explained how the process gave them a larger sense of the Lab itself, "You have to give demos where you showcase what you're working on... That exposes you to a lot of different things... I think that helped me learn the culture." The transmission of the Lab's culture through watching others perform, and soon after that actually participating in demonstrations, was the Lab's way of tacitly communicating what a successful role performance at the Lab looked and sounded like in practice. First by watching and then by "doing," or as one student put it, "The [Lab] has always fashioned itself as a 'maker-space' where the ethos is learning by doing... sort of kinetic like you're actually using your body to do stuff."

The actual logistics behind learning to perform demonstrations was managed by staff members responsible for organizing and scheduling tours for visiting groups of sponsors. A senior staff member explained, "For the newbies, I definitely put them on every demo possible. Like when they get here, the first month, like they're gonna be demoing, they basically get to shadow a senior student until they get it, and then eventually when they're OK with being on demos by themselves they get put on as many demos as possible." Program managers and other staff member interpreted the process of learning to perform demonstrations as a positive, developmental, and transformative experience for students, saying:

"You have a bunch of kids who come from all over the place... and a lot of them don't even know how to talk. I had a student that was so shy, it was hell for him to do these things, and you have to do them because of the way we fund our group... so I have them stand in, the new kids, for a while, and listen and then I'll have them do it, and have one of the older people there. But they come out being able to communicate. What do they do? They do startups, they do business. I don't think most of them could have possibly done that when they first walked in here. They have to talk to school children and they have to talk to sponsors, but these sponsors aren't always the science guys. They could be the marketing guys, right?"

Since demonstrations were viewed as a means to attract corporate sponsorship, students admitted becoming hyper-aware of the potential applications of their research projects in terms of its commercial viability. Students sometimes suggested that the Lab's sponsorship depended more on "selling" innovation than the empirical evidence, functionality, or scientific contributions. A senior PhD student, planning on doing a start-up, described how learning how to appeal to audiences' expectations can begin to influence students' research projects, "So this group has a lot of interaction with sponsor companies, and because people are demoing to the sponsors a lot, people are, I would say they're more focused on what type of product the technology could be used for than other more basic research areas. So I think in that way they're kind of primed to be thinking about that." Students were "primed" by their PIs and senior

colleague during demonstrations, and as a result of their participation learned what was considered a successful role performance.

Several demonstrations during a single internal event, “Crit Day,” illustrates the differences between what is considered a successful performance and one that needs tweaking:

Anya paced from one side of the projection screen to the other explaining and physically motioning the functions of the technology. She showed images of the physical prototype, which was on display as an exhibition installed in the lobby downstairs. She highlighted how the end product, while structurally sound, was “actually kinda cool” because of the different colors and abstract shapes that result as a byproduct of the material’s organic properties, and that even artists and designers would appreciate this. In closing, Anya offered an example of how the project might be applied by sharing images of a design previously developed by their PI (advisor), which showed a fashion model walking down the catwalk in a 3D printed couture dress.

This performance received a round of applause because, as one PI (advisor) said, it “bridges the arts and sciences” with a project’s commercial viability. This performance offered multiple framings of a project, at once an engineering, cultural, and commercial product.

In comparison, another student, Omari, was strongly encouraged to rethink and reframe his project in terms of its potential applications:

Omari showed images of their project in various phases with schematics and diagrams of the prototype being developed. He attempted to speculate about how the project could be scaled for production by displaying images of existing products. But Omari’s advisor immediately spoke up saying, “the applications are too cute” and continued, “you may be too attached to mundane applications,” which had been seen before. The advisor then said, “I’d like to push you because you’re better than that” and encouraged Omari to reconsider the framing of the potential applications by suggesting that instead of how it could be used as an illuminated iPad cover, for example, that it could be scaled to be retractable window shutters on eco-designed green buildings.

The difference between the two presentations is subtle, but in no uncertain terms students learned how to frame a research project in a multifaceted manner, making novel combinations between fields and movements like electrical engineering and fashion or industrial design and environmentalism, and how to avoid banal singular offerings in order to meet their various audiences’ expectations, and thus, what is considered a successful role performance at the Lab.

Newer students often sought guidance from their senior colleagues on ways of improving their performances. For example, I observed two senior PhD candidates, Yun and Amir, discuss “the art of showmanship” that was central to performing demonstrations with younger students. Amir began with a rhetorical question: “what are the methods you are going to use to deliver the sense of wonder?” Yun added, “It’s important as technologists to understand the art of showmanship and how to craft a story.” A skeptical younger student asked about the “tension” between “delivering results” from research versus “creating a sense of wonder,” and how this

could take away from the science and substance of their projects. Yun nodded in agreement, but replied that what was important at the Lab was to “ensure that it lands with the audience” in terms of “the experience they get.” Amir reiterated that demonstrations should “capture the audience’s attention.”

Of course, there was variation in the degree to which students embraced learning to perform demonstrations. In fact, some students seemed to struggle more than others with their meeting their audiences’ expectations. One senior PhD candidate, Austin, had been moved from one group to another, multiple times, because he was admittedly less than enthusiastic about performing demonstrations, and it showed. According to Austin, the latest group he joined would be his last, and he understood that either he develop a “thing” he could demonstrate or risk being asked to leave the Lab. This student explained he had difficulty developing projects that could be easily demonstrated because his interests were not aligned with what he believed sponsors would find appealing. In one observation I observed, Austin spoke in a low, monotone voice, but rushed through the slide deck deferring all questions in the interest of time. Students like Austin viewed the practice as perfunctory, which could influence the manner in which they performed demonstrations.

Credibly delivering a performance of their manifold roles

“But, you know, part of the impact that you have in the world is not just your brilliance and ingenuity to create something, it’s also that you should be able to sell it, right? And that’s usually gets forgotten in traditional academic environments... But here [the Lab] understood that, and [the Lab] has embraced that.” (PhD Student)

The subtle differences in students’ presentation styles and the skill set involved in delivering a successful role performance were displayed in a pair of typical demonstrations by senior PhD students. In the first, Siobhan and Jamal, both in their sixth year at the Lab, were presenting what program managers claimed was one of the most popular “demos” in recent memory. Popularity was assessed by the level of media interest and number of sponsors that returned and requested to see it. The pair of senior students had collaborated to design a large physical prototype of a shape-shifting machine. Siobhan identified with an academic orientation, claiming publications were her utmost priority and metric of productivity. She was generally very critical of the practice of performing demonstrations, and viewed it as a distraction that took her away from the “real” work of rigorous academic research. Jamal was less critical, open to “hacking” existing products, and said he might pursue a career in industry if academia did not pan out.

To begin, Siobhan stood at the center of the lab’s staging area showing no apparent interest in the visiting group of sponsors huddle together in a semi-circle near the prototype. She and the group both waited patiently. As the demonstration begins, Siobhan directs the group’s attention to flat-screen monitors hanging against a standing makeshift wall that separates the workshop area and the demo staging area. She introduces Jamal, the second student, who will explain the digitized visualizations displayed on the monitors while she prepares the large prototype of the shapeshifting machine they designed for a simulation. During Jamal’s explanation, Siobhan has quietly and slowly walked over to a desktop computer next to the display of the prototype to type in commands that starts the simulation of their technology. She

returns to stand by Jamal who continues to explain the project verbally. Both seem relaxed, confident, just as interested in what they are seeing as the audience should be.

The prototype is approximately three-feet tall and six-feet long, stands like a table, and is made of an aluminum frame structure that holds plastic square-inch pistons that move up and down in sequence on command. The pistons have also been programmed to follow hand movements and replicate any shape that is placed under the cameras, which are placed above the tabletop display hanging from rafters in the demo staging area. At one point, a ball is placed on one side of the table and is moved across the table by pistons that pop up, on the other side it is caught suddenly by other pistons that pop up and send it up and down slopes created by the pistons up and down movements. At another point, a basket is placed under the camera and the pistons cradle the ball, and then Siobhan slides her hand under the camera and the pistons take the rough outline of a palm moving the ball. The audience look on with wide-eyes, seemingly amazed.

At this point the PI enters the scene, steps forward, and suddenly begins to lead the demonstration by asking “who is a designer?” The students step aside. The group looks at each other and agrees that they are all designers. She then asks “who has been here before?” After a brief moment, the PI mentions that this project was exhibited during a recent design biennale in Europe, and was created in collaboration with a sponsor company from Japan interested in developing shape shifting furniture, but that it could be further developed to remotely build or dismantle things. An audience member asks how sponsors could pursue directed collaborations with research groups. The PI hands the visitors a brochure with images, descriptions, and logos from the most recent collaboration and went on to reference similar arrangements. The same audience member asked again about how much it would cost, and the PI replied with a specific dollar amount of “\$200,000.” But the PI clarified that this sum mostly covered “student stipends” at which point the member chuckled saying, “ah yes, labor cost” with a smile. The PI added that the academic research that comes out of developing collaborative projects was “priceless,” but also said, “it’s great to actually see your designs in people’s hands.” The PI goes on to explain that many projects being developed by students actually go on to become startup companies. The audience members appear impressed, nodding their heads approvingly and smiling in the direction of the two students standing nearby. Siobhan is standing back looking discreetly down at her cell phone. At the end of this demo, the PI attempts to rearrange pieces of the prototype back into place, but makes a mistake replacing one of the parts; with a hand gesture, she motions to Siobhan to come forward to fix it, which she does quickly without a word. The PI then hands off the demo back to the students, at which point the program manager enters the lab space to escort the visiting group to the next demonstration.

At first glance, it would appear that Siobhan, the academic-oriented student, was aloof and possibly less enthusiastic about performing demonstrations. But even if she did view the practice with dismissiveness or disdain, she had nonetheless developed skills that could ensure that she elicited positive evaluations for her work from varied audiences. In this scene, the PI stepped in, which was a normal occurrence across research groups, to help demonstrate the students’ technology, and in doing so, exhibited all of the same staging tactics students would be expected to deploy during their own individual demonstrations. On separate occasions, however, I did observe this same student team emphasize the commercial relevance of their academic research, without flinching or showing any sign of pretense. Even a lackluster performance could be buttressed by an impressive prototype, a short script, a mention of the scientific or societal

contributions the innovation would make, and allusions to how it could potentially complement audiences' commercial prospects. The motivation for students to deliver a successful role performance that was manifold, regardless of their current orientation, was simply being viewed as competent members of their research groups. In fact, a demonstration performed by a student who was industry-oriented, or planning on starting their own company, was not necessarily any more effective per se because, in general, the students learned to perform in a similar manner (during the actual practice), and thus acquired a similar dramaturgical skill set to deliver a credible performance of their manifold role. In the next scenario, we compare the scene above with a performance by a student that was wholly oriented toward industry below.

In another demonstration, a senior PhD student, also in his sixth year, presented his technology in a different manner. This student, Elon, was considering starting his own company based on his research project. Elon claimed that unlike others he was glad to perform demonstrations because he viewed them as an opportunity to improve his presentation skills and network with sponsors, and that he was always willing to share his work.

Before the visiting group of sponsors arrives and the demonstrations begins, Elon opened and connected his laptop to the large flat-screen monitor at the center of the staging area, quickly skimming his presentation slides, and running the software program he designed. His research project measures cognitive and affective states in consumers by using cameras to detect changes in facial expressions, and wristbands to monitor their heart rate. While we wait for the visiting group of sponsors to arrive, he tells me that he was just on a one-hour long phone call with [a sponsor company] about one of his current projects. I asked him about how this conversation with [the sponsor] went, and he said, "I met [this sponsor] through the [Lab] and we have had some really good conversations and they want to hire me..." At first, Elon appears confident in his ability to address different audiences, saying, "You have to speak to people in their language... I can make this relevant to any audience," and then a few moment later adds, "I give these presentations two to three times a week. It's become pretty standard to me."

To begin his demonstration, Elon introduces himself to the group of business executives sitting on black leather sofas across from the screen by explaining that although he has graduated already he came back "just to give this demo" because he has wanted to meet this particular sponsor for some time. He says he was asked to give the demonstration because of his expertise on "user experience." He uses a laser pointer to point to the screen, but emphasizes a particular aspect of the project using animated hand gestures to imitate the software's function. He uses screenshots of graphs to help visualize what his software's output looks like to the user. He then lists the companies that he has collaborated with previously based on this project. He has referenced his time at a well-known design consulting firm, IDEO, multiple times during the performance. At the last moment, he shares that he has plans to start his own company based on his research now that he has graduated.

Almost immediately after the demo is finished and the visitors have left there was a noticeable downshift in Elon's affect, a certain appearance of being underwhelmed or disappointed. He was both self-critical and critical of his audience. He listed things that he could have done differently or should do differently, like offering more specific examples of how his technology could have been applied to the sponsors existing products. He also made comments that suggested the audience did not understand his project. Elon claimed, like many other students, to be able to tell from the questions asked if they actually "get it."

In this instance, Elon draws on many of the same skills as his colleagues Siobhan and Jamal. The two demonstrations are similar in some basic ways. Both performances were given by students that were senior PhDs, both in a designated staging area, both of the technologies were innovations based on academic research, both included a combination of visual information to help describe their project, both spoke directly to the commercial potential of their research, both were aimed at making a positive impression with sponsors. However, there were also some subtle differences that highlight the contingencies of credibly performing manifold roles. One main difference, for instance, is that Elon's demonstration was less tangible, and thus less physically impressive. But, more important, another difference is that Elon actually shies away from mentioning its academic import and instead stays focused solely on the commercial relevance of his technology. In other instances, I observed him specifically emphasize how his technology can help children with certain neurological conditions to communicate their emotions, but in this performance he fails to mention this. Elon does experiment with dual roles by claiming that he is currently moving from being an industry consultant to an entrepreneur, but offered a mainly market-oriented framing. Even though the audience members were high-level executives, and presumably would be most interested in the potential for commercialization, in the context of the Lab, audiences are primed with presuppositions about the virtues of the organization's hybridity. Elon actually "oversells" innovation without grounding it in the sciences or as a solution to societal problems and thus does not come across as multifaceted. There were, of course, other ways students attempted to deliver a credible performance of their manifold roles.

In a slightly different situation, a visiting group from the Lab's parent institutions' corporate board stopped by a pair of students working on their project in the Lab's lobby. The group stood in a tight semi-circle and watched as the two students concentrated on the working-end of a robotic arm set up for 3D printing of wireframe structures made of various organic materials. The group stood back a few feet behind a protective clear plastic shield held up by aluminum frames in front of the robotic arm that enclosed and table-top printing area. The young man and woman, Anya and Rodrik, had been working at the table-top with their heads down for some time before they took notice of the audience observing them. However, upon realizing the group was there the students began an impromptu demonstration of their project for the visitors. The first student, Anya, took only a few minutes to present the overall idea and describe the materials that were being used to make the structures. The second student, Rodrik, presented on the process of programming the robotic arm. He typed in a command on the laptop nearby and the robotic arm began to release a gel-like material onto the table-top, moving back and forth, creating a lattice structure, and once it had stopped the printed wireframe was slid under curing lamps. To the side of the table there is a finished example that has been hardened and molded into a cocoon shape to be displayed as a standing sculpture in the lobby exhibition space. There were others like it arranged in a row just behind the students. While the majority of the visiting group followed along, a few of the visitors stood back and slightly to the sides speaking in hushed tones amongst themselves and checking their cell phones. Rodrik noticed that some audience members were drifting and became focused on keeping the attention of the members of the group that were still paying attention. At that point, he came around the table closing the distance between himself and the audience, became more animated, and motioned with his hands for the group to come closer to the freshly printed structure curing on the tabletop. Anya then

spoke up and commented that these designs could be used to create various “scalable structures” for industrial purposes, but using “renewable” organic materials instead of synthetics.

In this instance, like the other two examples above, a number of the skills students developed by participating in demonstrations are observable. First, presenting a physical prototype was thought to have many advantages by students, including capturing the imagination of audiences without needing as much description as more conceptual projects. Second, having a short script prepared to ease the explanation of their technology was also helpful. Third, if students thought their audience was drifting they would use techniques meant to re-engage the audience’s attention. For instance, by approaching or inviting them in closer to the prototype to “play” with it. Most often, students would highlight the potential commercial applications of their projects to affirm its relevance to “executives.” These staging tactics were used by students with varying orientations and were observed across demonstrations.

In the following section, the paper documents the specific set of transferable skills that student-employees develop as a result of having to perform demonstrations on a regular basis for varied audiences. In closing, the actors’ own interpretations of demonstrations are considered, which speaks to how accomplishing hybridity by “doing” a multivocal identity is not without its particular challenges.

Developing Transferable Skills

How “doing” a multivocal identity is accomplished at the Medici Lab

“I’m a kinda reserved person, but when I’m given a stage, I’m like a very different person, and I definitely, kind of intentionally, switch to that stage performer mindset... it’s a skill you cultivate...” (Senior PhD Student)

At the Medici Lab, students develop skills that would enable them to deliver a successful role performance and immediately establish their competency as members of their research groups. The director of public relations explained how they believed students benefited from performing demonstrations,

“I think the experience that the researchers get here from their engagement with our members, from the way they present their demos and explain their demos, and you know, the diversity of the visitors we get here sort of requires our students to be able to talk about their work in ways that are relevant to, you know, so many different audiences, and people from so many different sectors.”

The students came to view their newfound capabilities as an asset that would serve them in the future. This section outlines the particular dramaturgical skill set that students acquired as a result of performing demonstrations.

Prop making (prototypes). By observing and performing demonstrations, students learned what types of research projects were considered “demo-able.” A Master’s student explained, “You need to have something... A thing that works, like, that you can show people... awesome projects that are tangible that you could demo.” Students produced physical objects to aid in the

staging of their research projects so that it elicited positive evaluations from audiences. A student explained the Lab's approach, "I would say there's an overarching philosophy of storytelling and communication through the physical objects in our world." A senior staff member give their interpretation of the rationale behind this focus on tangible objects, "it's sort of a human nature thing. Touchable, it's explainable, they wanna see what's in there, so, you know... the work is perceived maybe as sexier than others." This allowed students to rely on their audience's presupposed associations between a tangible artifact, the materiality of technological innovations, and a marketable product.

Prototypes were similarly symbols of the Lab's multi-vocal identity—academic research embodied in prototypes with the potential to be developed into market products. The presentation and strategic placement of prototypes (ranging from wearable sensors in wristbands to robotic prosthetics) left out on display were used like props to support students' claims of "radical" innovation during their performances. Prototypes that were very popular were displayed on pedestals enclosed in clear acrylic cases like you see in a museum. Students would also reference popular consumer products "in the physical world" that were similar in design to their own technology in order to stoke the imaginations of their audiences and bring a concreteness to the more conceptual projects. Performing demonstrations without the support of prototypes raised questions about their competencies. A senior PhD student that identified with being an academic claimed:

"When you're first doing this, it's a little stressful if you don't have good demos to show people... I think [pause] my most recent project is just not something that's very easy to demo... and it was hard because... you don't have an artifact. There's no immediate interactivity... it's very different than just showing up, and having, everyone's face just understands the dynamic of the artifact. So it was a bit more of me working just very isolated on the project. You feel a little bit more isolated when your work isn't something that can be demoed as easily."

The same student continued, expressing reservations about this aspect as well,

"So there's a lot of pressure to have a demo... it really can shape how you build your research, and in some cases, that's not great. Like I've had a lot of projects that I think are really good, excellent projects, but are not really demo-able... But if you have a really killer demo and there's crowds of people wanting to see it, then you really feel more like a [member]."

Other students also expressed ambivalence over what they viewed as an overemphasis on prop making. As one Master's student shared:

"So many groups are building like really fun hands-on physical objects that light up and stuff [laughs], like that's just gonna attract people, and people's imaginations, and enthusiasm more than, you know, a probably much more important project to create [social justice] in another part of the world."

Students, although not all, became disposed to design physical objects to support the more theatrical aspects of their performances.

Scripts and storytelling. By performing demos, students practiced talking about their research by mimicking the ways in which their PI's and senior colleagues talked about their own work in demos. Students were actively encouraged to learn and develop stories that were shared amongst members of their research groups, which would assist the newer students in delivering their own performances. Thus, they borrowed stories and metaphors that they heard others use during their demonstrations to improve their own. These shared stories served as scripts students could fall back on, especially when presenting research projects from the group's portfolio that they themselves were not a part of designing. That students had these scripts memorized help them appear confident and authoritative even with topics they knew only a little about, or had no interest in. Communicating the potential applications of a project in such a way that it is appealing to audience depended on effectively delivering a compelling story of their academic research. A second-year Master's student explained the process, "I shadowed people doing big demos just to get the notes, one of the useful things is that you can describe the tech that they've created, but slightly more useful things are the metaphors that they use to describe the experience, and stuff like that, so you pick up like the way that they tell the story, and then you just tell it the same way as well." Others echoed this student's experience, saying, "It's helpful to see how people talk about their work... It's given me a good frame for how I talk about my work." In one instance, as a new student stood by and watched their senior colleague perform their demonstration, the PI (advisor) approached and whispered to the new student, "it's important to create your own stories," which would assist the student in delivering their own performances.

Reading cues. Students also learned to monitor their audience's level of interest to determine whether they were following along. A senior PhD student, planning to do a start-up explained, "It's just a matter of trying to read your audience, and what type of understanding they have, and just trying to tailor whatever we're doing to them," and then continued, "You get kind of a feel for it." As they explained the functioning of a prototype they scanned the audience for reactions to particular aspects of the technology. Students read audiences' reactions, monitoring for smiles, head nods, or listening for laughs and silences, questions, and a round of applause. Students focused on keeping the audiences' attention engaged. The same student said that it took "simultaneously knowing your audience, 'are they moving, are they looking at you?'" When audiences seemed distracted, students used techniques meant to bring their gaze back to them or the prototype. Closing physical distance between themselves and the audience members by inviting them in closer to the prototype or flat-screen is a common technique used if students read their waning interest. Students also punctuated transitions between slide images by asking volunteers from the audience members to "play" with prototypes displayed nearby. In instances where the PI's and the students were presenting at the same time, the interaction between the pair was choreographed so that the student knew what was expected of them and did not need to be told how to assist at certain points.

Improvisation. In addition, students learned to adapt their performances on the spot so that it was appealing to various audiences' interests. A given audience (i.e. corporate sponsors versus a

journalist) cued what framing the students would offer, or at least which one to invoke more heavily or not, in order to credibly deliver their manifold role performance. As a senior PhD student with an industry orientation claimed, “It depends on who you’re talking to... you have to speak to people in their language... I can make this relevant to any audience... I’m just giving the audience what they want.”

Delivering “dramatic” performances. Finally, students learned to communicate the more imaginative, less familiar aspects of their technology through theatrical self-presentation strategies. Students often quipped, “the task is to put on performances” and “we have to put on a show.” At the beginning of one demonstration, a student jokingly opened by saying “welcome to the second act of the day.” Most commonly, students used humor. Demonstrations were performances comprised of physical positions, postures, and gestures, as well as rhetorical devices, verbal intonations, and vocal inflections. In their verbal deliveries, for instance, students might pause, appear serious, and speak more slowly in a lower tone, follow with a quickening in their cadence, which complemented their hand gestures as they emphatically mimed the prototype’s functioning; and then upon registering an “aha” moment from the audience, smile and laugh. Students also learned to use animated body language that mimicked the rotation of gears, or firing of circuits, incorporating sweeping gestures with their hands (and legs) to explain the functioning of their technology. Or students would periodically reposition themselves, by physically stepping forward to close the distance or backwards to create space between themselves and the audience. Or students might hasten the pace of the demonstration claiming there were so many “cool” projects to get through they would need to hurry, which created a sense of urgency. The contrasts in the delivery created a rhythmic cadence, but all of this was done naturally as if it had not been choreographed or rehearsed. In some cases, however, as students went through these motions their posture and body language appeared rigid and stiff, the timing was off, and their smiles and laughs seemed somewhat nervous or practiced. If the timing was noticeably abrupt, engagement with the audience, such as handing small devices to sponsors was not always effective, and came across as a formulaic, awkwardly forced task on a checklist.

In sum, students developed a transferable skill set, learning to frame their technology in multiple ways simultaneously. Regardless of their prior orientations students became adroit at exploiting rhetorical resources from different occupational orientations (Fine, 1996). During a single performance, different framings of their research would be offered to prime audiences’ evaluations. Given that their projects were based on research conducted in an academic setting, a framing that emphasized the scientific contributions could be drawn upon. Students might also frame their projects’ as a potential solution to societal problems (usually educational or medical in nature). Simultaneously, students would then offer a framing that emphasized the viability of their innovations in terms of the sector, scale, market segment, and complementarity with existing products that the technology could potentially exploit. The degree to which the students would draw on one framing more so than the other varied depending on the cues from their audience. Almost invariably, however, the students offered multiple framings for their technology during demonstrations. Although these skills could be viewed as assets that could be applied in their future careers students were also ambivalent about the actual practice of demonstrations.

Students' interpretations of performing demonstrations

Student-employees sometimes expressed an uneasiness, and even disdain, over performing demonstrations, and often questioned their relevance because it was not entirely related to getting a graduate degree. These students claimed that direct engagement with corporate sponsors raised skepticism about the Lab's academic rigor compared to other traditional programs. One PhD student commented, "I mean, the thing is, from an academic perspective... I can definitely tell you that there are some people who think that the [Lab] is not a very serious or traditional academic institution." Students and staff members also claimed demonstration were perceived by outsiders as a "sham," or "sideshow" and "smoke and mirrors," or a "dog and pony show," and that the organization was mainly interested in generating a "buzz" in order to attract more sponsorship. The building itself was likened to a "museum" or "zoo" that exhibited students themselves just as much as the prototypes on display.

Students planning on going into academia were ambivalent about the Lab's direct engagement with private-sector audiences. A newer student coming from working in industry and planning on pursuing his PhD said,

"I haven't understood how this setup can work, because when a company that's for profit is funding you, they're not just doing it for the greater good of society, at the end of the day, they care about profit, you know. So I just don't understand how you can maintain your academic character and work on things that necessarily don't have any short-term gain, and also be supported by for-profit companies."

The same student added:

"I'm not complaining, but I really haven't understood the relationship between the sponsor companies and let's say my research... so for example, we've got these demos... why do I have to present to them, it's just that these people provide money to the [Lab], and you have to present to them... so that is something that I would like to avoid."

One senior PhD candidate with an academic orientation said, "I have mixed feelings about that, since we're an academic institution, but it's just a fact that the culture shifted towards people thinking more, towards like market oriented innovation." Similarly, another senior PhD student taking an academic position at a traditional science and engineering program explained:

"Before I came here, I was much more radical, on the side that academic institutions should be as far away from industry as possible in order for them to be able to do long-term research, because obviously companies are very focused on, you know, short-term profit and products. And I still feel that way in part. I feel like the Lab should definitely try to keep the freedom to do that, you know, crazy long-term thinking work."

However, many students I interviewed seemed to come around to the idea that being able to offer framings from both academic and commercial worlds, instead of being at odds, is a valuable skill that could complement their primary professional orientations. A separate pair of

academic-oriented students shared their experiences of coming to terms with performing demonstrations:

“I come from a place where they publish papers... Sometimes you see people that just focus on media, and they get very good job offers, very good recognition and everything you might want in your professional career... So I have to, I mean, this has been a journey for me, trying to learn how that works. How can I benefit from both worlds? I’ve been trying to reason about that, and what would be the ideal combination.” (Senior PhD Student)

“I think the things that the [Lab], people at the [Lab], focus on are products. They tend to build products [pause]... They don’t care about publications. And so that is the culture... And so at the beginning, I was not really positive about that type of culture, but recently I’m starting to also think that that could open up a new world for me. I could start my own business, it’s a product that people can use, and, you know, I can impact the world that way, and that opens up a whole new way because when you become a successful businessman, you get to know all these different people and then whole new doors open up for you, and you can impact the world in a different way.” (PhD Student)

Some students had very positive opinions about demonstrations and viewed it as an opportunity to hone their presentation skills:

“We have to give more demos... Basically that’s for the sponsors, they pay to come here, and then they send business people to see what we’re doing... they don’t really know what we do... So sometimes we feel that that’s kind of missing the point, but at the same time, there are so many benefits of it for other things. Like public speaking, being able to communicate your projects in a clear manner. That chance to practice in front of people, not everyone has. There are a lot of people who pay to get that chance. And also, being able to interact with business people, which basically provides a unique advantage when we are innovating and creating new things.”

Another senior PhD student, planning on going into industry, expressed a similar opinion,

“If you look at it as a time to reflect, it gives me practice. Every time that I present to these companies I’m getting better and better. That is a very valuable opportunity. It’s not easy to get experience presenting to vice presidents and executives at least two times a week. That’s a skill that’s going to be valuable for me in the future. So I recognize that... If I had to choose between having a degree from the [Lab] and being able to speak in front of people I would choose being able to speak.”

Likewise, a senior PhD student that planned to stay in academia agreed, saying,

“I’ve had a lot of interesting, very important people come that I’ve demoed to. I’ve gotten a lot more comfortable with that, which is a great skill you learn at the [Lab]. So the opposite side to less publications is that you get that skill, which is very important. Right? If you cannot talk about your work, no-one cares about it, right?”

During a research group meeting I observed, in response to a question from a student about how the faculty reconciled being an academic that had also created a startup, the PI (advisor) replied, “personally speaking I prefer the academic to the business world,” but claimed their motivation for “doing a startup” was that “the technology we built is needed out there and can change people’s lives, and so I feel motivated to get the devices out.”

Table 3. Interpretations of the Practice of Performing Demonstrations by Student Types*

Occupational Orientations	Data
Academic-oriented	<ul style="list-style-type: none"> ▪ “The [Lab] is all about demos, and showing products, and all that, which is great, which is very important, but I think in a scientific field, you need to publish.” ▪ “Demoing is a very solid business strategy, and it's a very good idea that says, 'let's do something quick and see what works,' but from an academic standpoint that's very poor science.” ▪ “I mean a cynical person would say it certainly changes the amount of funding, because like there’s the consortia model, but then there’s also like other external money that comes in, and gifts and stuff, and that’s largely based on how sexy your projects are.”
Industry-oriented	<ul style="list-style-type: none"> ▪ “The value from them I think was just honing presentation skills, storytelling skills, you have to explain why this is useful, and what it does. If the demo’s really good, it does that almost like for you, you don’t have to say much.” ▪ “The way that we get our work out in the world here is not necessarily through the traditional academic publishing route, although there are certainly groups and people who do publish academic work... Another way that we get our work out into the world is by having physical projects that we can show people that come and visit the Lab, and it’s a way that we can also deploy our ideas out into the world. ”
Entrepreneur-oriented	<ul style="list-style-type: none"> ▪ “I’m very interested in application, and demos, because I acknowledge that that’s what people understand more than research publications. So I think it’s a combination of both, which is the optimal thing.”

*Quotes taken from formal interviews with Master’s and PhD students (N=22)

Interestingly, the Lab admitted (or “hired”) students with varying professional identities, and although the student-employees expressed ambivalence, these students did not ultimately refuse to participate in the central practice of performing demonstrations. Furthermore, the Lab manages many challenges that have been observed in other settings as a result of embodying organizational hybridity through this common integrative practice.

DISCUSSION and CONCLUSION

“The demo culture plays this big role in kind of getting people to feel connected and involved because generally, in the first couple of weeks of being here as a student, you have to give a demo, and you have to represent what the group is up to, and what you have been doing. So kind of quickly you’re speaking on behalf of the group to these audiences that are coming through who are generally business executives. I think that sort of played a role in like well ‘oh, ok I guess I am part of this because I am talking on behalf of the group.” (MAS Student)

Hybrid organizations make identity claims that cross competing, seemingly contradictory, normative boundaries. These organizations attempt to meet the expectations of varied audiences simultaneously. As a hybrid organization, the Medici Lab engaged audiences across academic and commercial worlds being both an academic program and an innovation incubator partnered with corporate sponsors. During the Lab's common practice of performing demonstrations students learned to present themselves as academic researchers, hackers or social activists, product designers, artists, and entrepreneurs, without betraying any sign of pretense. The students were also encouraged to design research projects that were themselves multivocal, technology that could be considered a rigorous scientific contribution, promising a solution to a societal problem, yet just as easily a marketable product. The context of the Lab serves as a case study of how it is possible for distinct, often competing, normative orders to persist alongside one another within the same organization (Murray, 2010).

This paper explored how embodying a hybrid organizational form can be successfully accomplished by relying on individual employees. Playing a new role within an organization can be viewed as betrayal of prior commitments to an individual's preexisting professional orientation, which comes with the risk of possibly being excluded from occupational communities beyond the particular organization. Identity conflicts among employees are especially challenging for hybrid organizations (Pache and Santos, 2013; Battilana and Dorado, 2010; Besharov and Smith, 2014), which can lead to infighting among organizational members (Golden-Biddle & Rao, 1997; Glynn, 2000), persistent dysfunction between groups (Pratt & Rafaeli, 1997; Ashforth and Reingen, 2014), as well as organizational failure in the extreme case (Turco, 2012). Thus, the prevalence and consequences of identity conflicts have been the main focus of existing theories, which assume that resolving tensions is a necessary condition for accomplishing hybridity. Surprisingly, at the Medici Lab, bringing together varied individuals with prior professional orientations did not lead to the kind of identity conflicts that have been observed in other hybrid organizational settings.

In this case, rather than actors being blank slates (Battilana and Dorado, 2012) with no prior occupational orientations that could be trained to "balance" their commitments, graduate students came into their new organization with varied work histories and aspirations (academic, industry, or entrepreneurial), which had been informed by years of previous experiences in their respective fields. Those accepted enter the Lab with preconceptions of themselves as well as their anticipated role as graduate students. They were journalists, architects, engineers, designers, computer programmers. Yet, student-employees did not interpret the practice of staging and selling innovation during demonstrations as entirely negative. The students' immediate motivation for delivering a successful role performance that met audiences' expectations was being viewed as competent members of their research groups. In many ways, demonstrations were a medium through which students acquired and displayed their newfound competencies, and established their status as members of their research groups (Becker and Carper, 1956; Schein and Van Maanen, 1976; Van Maanen and Barley, 1984; Orr, 1996; Anteby, Chan, and DiBenigno, 2016). As faculty and senior colleagues modeled the virtue of being able to perform demonstrations newer students came to view their newfound skill set as an asset rather than a liability, and not as contradictions or betrayal to their prior commitments, but as positive additions to their preexisting professional identities. For the student-employees, the question of

“who am I” was inextricably entwined with the forward-looking question of “who do I want to become.” Ultimately, students took up their new diversified roles, all while maintaining a sense of being genuine members of their respective occupational communities.

Professional identities are taken up and instantiated during role performances, and developing the skills that support the successful delivery of the role itself are key. Indeed, professionals possess specialized skills to perform their specialized roles, and police their occupational jurisdictions and standards of excellence by distinguishing the skilled from unskilled (Abbott, 1981; 1988). However, skills may also be applied across roles, and these transferable skills can actually be acquired by actors through participating in practices that are outside their specializations. In particular, within a hybrid organization, the “ideal worker” is not necessarily a specialized role that is prescribed by a single, professional archetype, but in fact is often an amalgamation of ostensibly contradictory roles. Again, the findings point to the importance of considering how hybrid organizations present their employees not only with challenges, but also with opportunities to acquire capabilities such as transferable skills. At the Medici Lab, a common practice, performing demonstrations, gave student-employees, anchored in disparate occupational communities, the opportunity to develop a skill set that would support their manifold role performances.

Looking at different actors within a single organization, we identified a discrete set of skills that enabled organizational members to enact multi-vocality, credibly offering multiple framings of their technology to their varied audiences simultaneously. Specifically, students learned how to make props, how to use scripts, how to read cues, to improvise, and ultimately deliver a dramatic performance, which enabled each type of student to credibly offer multiple framings of their work. These skills were immediately being put to use in sustaining the Lab as a hybrid organization, but students came to believe these skills would serve them in the future. The acquisition of these skills was a direct result of participating in demonstrations and helped these actors cope with their ambivalence and go on to credibly play their manifold roles. By tacitly teaching its students dramaturgical skills to deliver role performances on its behalf, the organization sufficiently reduces tensions and thus accomplishes its own hybridity.

Students learned to design projects, develop prototypes, and produce performances that appealed to audiences’ expectations, thereby learning how to “stage” and “sell” innovation. Indeed, demonstrations served many purposes (i.e. communicative, ideational, and instrumental), and communicated the concept, form, function, and potential applications of a given technology. But they were staged in a way that was intended to “inspire” a “sense of awe” in audiences by presenting research projects in a theatrical form. Across performances, there were general patterns in terms of self-presentation and audience engagement, and while there was variation in presentation styles students with varying orientations learned to enact multi-vocality in the same ritualistic fashion (Goffman, 1959, 1961; Kunda, 2009). Ultimately, across the different types of students each acquired a similar dramaturgical skill set.

This article proposes a first step in the effort to better understand how tensions that stem from the potential for conflict based on individual’s professional identities may be managed, even though the tensions (or ambivalence) that arise from performing hybridity are not

necessarily ever completely resolved. In fact, in the current context, tensions are renewed with each cohort that arrives. Yet, analysis of an integrative practice across the organization helped identify the conditions under which individuals may develop certain transferable skills that help them reconcile playing manifold roles that transgress the normative boundaries of their respective occupational communities.

This study's dramaturgical analysis of the performance of demonstrations provides an alternative approach to understanding the day-to-day practices that help sustain these novel organizational forms. This paper extends current work on hybridity by exploring the mechanisms for how organizations actually perform hybrid organizational identities in practice. The findings suggests that in addition to structures, strategies, and training, integrative practice-based mechanisms may help successfully socialize employees with various professional identities into enacting multi-vocality, while allowing actors to develop transferable skills to deliver on their manifold roles of being academics, hacktivists, and entrepreneurial innovators. During demonstrations each student learned to strategically deploy a broadened repertoire of cultural tropes (Swidler, 1986; Fine, 1996, Sauder and McPherson, 2013) that were used to frame their technological innovations as multifaceted. Thus, identifying specific skill sets that individuals acquire to support manifold role performances offers a foundation for grounded analysis of how these organizations sustain their own hybridity.

The current study also provides insight into how an organization leverages the varied professional orientations of their personnel to instantiate its own hybridity while managing the potential for identity-based conflict. However, the relevance of this case study and its findings are not confined to the particular practice of technological demonstrations, nor to hybrid organizational forms. Across professions and organizational settings, the capability to stage and sell innovation through multi-vocal, self-presentation strategies is becoming increasingly widespread. This has been documented in professions ranging from screen writers pitching their scripts to Hollywood producers (Elsbach and Kramer, 2003), music producers brokering popular music hits (Lingo and O' Mahoney, 2010), to early-stage entrepreneurs pitching business plans to venture capitalists (Chen et al., 2009; Pontikes, 2012). The success of individuals in pitching their projects, on behalf of organizations, to varied audiences of investors or consumers in high-technology and cultural industries is increasingly contingent on delivering a role performance that is manifold, at once a combination of a set of well-honed competencies in their craft but also a representation of its value in relation to some larger, more abstract, concern. As the practice of performing demonstrations becomes more prevalent in other fields, identifying and comparing skills sets across contexts opens possibilities for future research.

This paper's analysis suggests several testable hypotheses, which offer several lines of inquiry for future research. First, I hypothesize that the particular skills that help individuals overcome challenges posed by enacting multivocal framings will vary with the organizational setting and autonomy of the individual actors. Second, the construct of manifold roles, or the set of various types of roles that are played in combination by a single actor, will likely vary with the organizational setting and autonomy of the individual actors. Third, the successful integration of employees through common practices will vary with the organizational setting and autonomy of the individual actors. Additional research should specifically test these relationships. It is also

likely that normative expectations for performers will vary with the authority of the individual actor within the organization. Thus, the capabilities of individual actors to enact multi-vocality on behalf of a particular hybridity should vary as well. Lastly, the implementation of integrative practice-based mechanisms is likely to differentially affect patterns of sustaining hybrid organizational forms. Future studies might explore these propositions within other hybrid organizational settings.

I conclude by suggesting that the integrative practices and skill sets that go into sustaining modern, complex organizations with multivocal, hybrid organizational identities need to be further explored. For those who suggest that the alignment of competing logics explains variations in sustaining of hybrid organizations, this work suggests that researchers should further explore integrative practice-based mechanisms that instantiate the articulation of particular logics, which are distinct, but, rather than necessarily being contradictory, might be reconcilable if individuals are given a transferable skill set to enact multi-vocality.

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